What is Claimed is:

1. A method for predicting an individual's bronchodilating response to an agonist of β_2AR, which comprises determining the individual's genotype for the +491PS, wherein a heterozygous C/T genotype or a homozygous T/T genotype indicates the individual is likely to exhibit a poor bronchodilating response to the agonist.

2. The method of claim 1, wherein the agonist is selected from the group consisting of salmeterol, albuterol, metaproterenol, terbutaline and formoterol.

3. The method of claim 2, wherein the agonist is salmeterol.

4. The method of claim 3, wherein the individual suffers from asthma or COPD.

5. The method of claim 1, wherein determining the patient's genotype comprises isolating from the individual a nucleic acid mixture comprising the two copies of the β_2AR gene, or a fragment thereof, that are present in the individual and determining the identity of the nucleotide pair at a position corresponding to the +491PS in the two copies in order to assign a β_2AR genotype to the individual.

6. A method for predicting a patient's bronchodilating response to an agonist of β_2AR, which comprises assaying a sample from the patient for expression of the Ile164 β_2AR variant, wherein presence of the Ile164 β_2AR variant indicates the patient is likely to exhibit a poor bronchodilating response to the agonist.

7. The method of claim 6, wherein the agonist is selected from the group consisting of salmeterol, albuterol, metaproterenol, terbutaline and formoterol.

8. The method of claim 7, wherein the agonist is salmeterol.

9. The method of claim 8, wherein the individual is suffering from asthma or COPD.

10. The method of claim 6, wherein the assaying step comprises contacting the sample with an antibody specific for the Ile164 β_2AR variant.

11. A method for treating a patient suffering from asthma or COPD, which comprises

determining the patient's genotype for the +491PS and

making a treatment decision based on the genotype,

wherein if the patient has a heterozygous C/T genotype or a homozygous T/T genotype, the treatment decision is selected from the group consisting of:

(a) prescribing a higher dose of a β-agonist than typically indicated for individuals having similar weight and symptoms;

(b) prescribing more frequent doses of a β-agonist than typically indicated for individuals having similar weight and symptoms;

(c) prescribing both a higher dose and more frequent doses of a β-agonist than typically indicated for individuals having similar weight and symptoms;

(d) not prescribing a β-agonist; and

(e) prescribing a β-agonist in conjunction with another bronchodilating therapy.

12. The method of claim 11, wherein the agonist is selected from the group consisting of salmeterol, albuterol, metaproterenol, terbutaline and formoterol.

13. The method of claim 12, wherein the agonist is salmeterol.

14. The method of claim 11, wherein determining the patient's genotype comprises isolating from the individual a nucleic acid mixture comprising the two copies of the β_2AR gene, or a fragment thereof, that are present in the individual and determining the identity of the nucleotide pair at a position corresponding to the +491PS in the two copies in order to assign a β_2AR genotype to the individual.